OPERATOR'S MANUAL

GeoSystem 250 OS

GEO line electronic
powered by dinamica generale

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2 INTRODUCTION

Congratulations Dear User,

You have chosen a product by GEOline electronic, a leading co mpany i n t he d evelopment a nd pr oduction of e lectric weighing systems. For years now, the international trade repays our quality, experience, reliability a nd a bove a ll our t echnological i nnovation i ndicating a n a dvanced and revolutionary know how. These are the pillars of our work and according to these beliefs w e ar e at your s ervice, pr oviding you a si mple but m odern, accurate and efficient product that supports you in making your work easier for more y ears. This users manual i ntends t o t ake you t hrough t he di fferent performances of the weighing system in the easiest way and to show you some new functions as well. From configuration to use with several optional at your disposal up t o the service o f d efective r esearch and t o se curity n orms o n equipments, GEOline electronic would not forget any information, sure to offer you more support and technical assistance.
Now there is nothing left for us to do but wish you a work well done!

The team of GEOline electronic

3 LEGEND

This user's manual uses some conventional signs, in order to lead the user during the reading of important instructions and advices; these concern especially the setting of the parameters of the system and thus its correct working.
Please pay attention to the following icons:

	It indicates further explaining and information.
	It highly recommends to pay attention.
	It indicates an operation that can be repeated many times, cyclically.
	It indicates the norms to respect.

4 INTENDED USE

Management system of distribution designed to work on agricultural machinery for spraying and crop spraying applications.
The accurate control of the operating parameters of the system sprayer or orchard increases the effectiveness and efficiency of the treatments, reducing the wastage of chemicals.

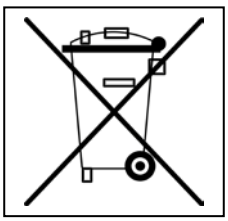
5 WARNING

The power supply must be connected directly to the battery or to a regulated feeder.
The power supply must be protected with a 10A fuse.
If it is not the case, GEOline electronic is not responsible for damages to the micro computer.

Disconnect the power supply cable from the micro computer when the battery is undergoing recharge.
If it is not the case, GEOline electronic is not responsible for damages to the micro computer.

Disconnect all lines from the local plant before undertaking welding on the vehicle.
If it is not the case, GEOline electronic is not responsible for damages to the micro computer.

For a correct functioning, please make sure that the battery has always a higher voltage than 10, 5 Volt.



This marking on the product or on its packaging illustrates that, under European Directive 2002/96/EG governing used electrical and electronic device, this product may not be disposed of with normal household waste.
You are responsible for disposal of this equipment through a designated waste electrical and electronic equipment collection. To determine the locations for dropping off such waste electrical and electronic, contact your government office, the waste disposal organization that serves your household or the company at which you purchased the product.

Before cleaning the agricultural vehicle with high pressure water jets, protect the equipment from any possible water entrance. In addition, take great care not to subject the devices, cables or any options to direct jets of water.

If the equipment needs to be cleaned, use a soft, damp, lint-free cloth. Do not use sprays, solvents, abrasives, or sharp or pointed objects that could damage the indicator.

ENGLISH

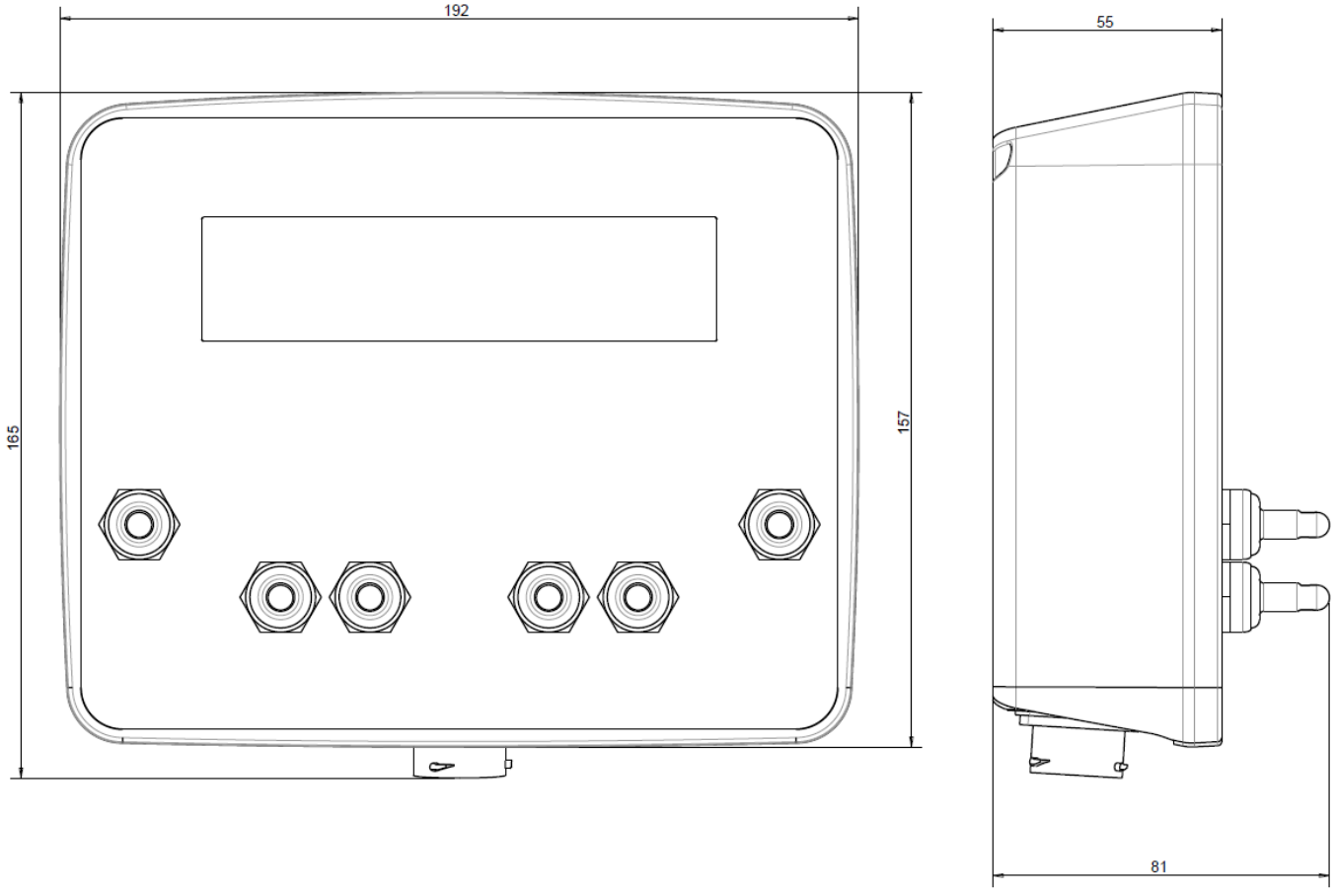
6 PACKAGE CONTENT

8410037 - Kit GeoSystem 250 OS 2W	
Description	**Qty**
Indicator GeoSystem 250 OS 2W	1
Driver Box W	1
Power cable L=3.5 m+ Com cable L=5 m	1
Valve cable Type B L=1.2 m	4
Speed sensor L=5 m	1
Fixing Support	1

8410038 - Kit GeoSystem 250 OS 4W	
Description	**Qty**
Indicator GeoSystem 250 OS 4W	1
Driver Box W	1
Power cable L=3.5 m+ Com cable L=5 m	1
Valve cable Type B L=1.2 m	6
Speed sensor L=5 m	1
Fixing Support	1

Table 1- Package

7 DIMENSIONS



Picture 1 – Dimensions of indicator

8 ACCESSORIES

GeoSystem 250 may be equipped by these accessories:

ACCESSORY	DESCRIPTION
Magnetic Flowmeter	A sensor to noting the flow and to calculate the litres
Paddle Flowmeter	A sensor to noting the flow and to calculate the litres
Pressure Sensor	A sensor to measuring the pressure
Level Sensor	A sensor to measuring the liquid level in the tank
Sucker hangers with mini VESA connection	Hanger to fix in a glass surface

Table 2 - Accessories

9 TECHNICAL DATA

Indicator Dimensions(mm):	192 x 163 x 55 (without fixing support)
Indicator weight (gr):	~ 1000
Indicator Case:	PA66 IGF 30 % native color RAL 9005
Indicator Protection:	IP 67
Switches Box Dimensions (mm):	167 x 69 x 72
Switches Box Weight (gr):	~ 1100
Switches Box Case:	PA66 IGF 30 % native color RAL 9005
Switches Box Protection:	IP 67
Valves Driver Box Dimensions (mm):	210 x 130 x 45
Valves Driver Box Weight (gr):	~ 1100
Valves Driver Box Case:	PA66 IGF 30 % or polypropylene
Valves Driver Box fixing support:	Stainless steel AISI 304
Valves Driver Box Protection:	IP 67
Operating temperature:	-20 / +65 °C
Power supply:	9,5 – 32 Vd.c. (alarm “LOW BATTERY” < 9,5 Vdc)
Display:	Alphanumeric display 16 column x 2 rows area dimensions 123 x 30.4 mm with backlight
Display view:	> 2 mt
Types of power cables:	Cable FROR 18 x 0.75 black sheath
	Cable FROR 12 x 0.75 black sheath
	Cable FROR 2 x 2.5 black sheath

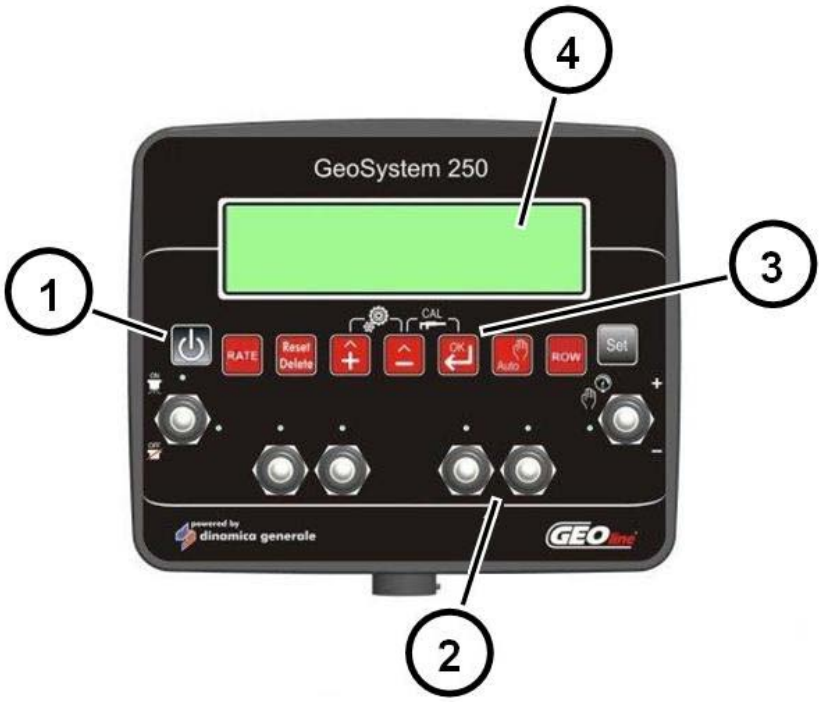
Table 3 - Technical Data

10 INSTALLATION OF COMPONENTS

10.1 CONFIGURATIONS

10.1.1 Indicator GeoSystem 250 Orchard version 2/4 sections

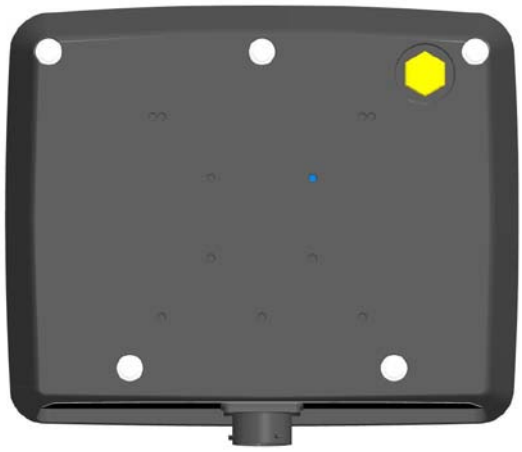
On the front, there are a series of switches that manage the section valves of boom, the general control valve and the switch to increase / decrease the flow and pressure rate.
It is envisaged also the manual and automatic regulation of the flow and pressure.
The operator sets the value of the liquid sprayed (liters per hectare) and the indicator regulates the volumetric valve depending on the speed of travel and on the active sections.
The operator can act on the regulation switch if he wants to increase or decrease the amount of liquid sprayed.



Picture 2 – Indicator

1. **ON / OFF key.**
2. **Series of switches in 2 positions (ON-OFF) to control the general valve and section valves (2 or 4). 1 switch with 3 positions (ON-OFF-ON) with spring return in the OFF command for volumetric valve**
3. **Function and setting key**
4. **Alphanumeric display 2 rows for 16 characters with backlight.**

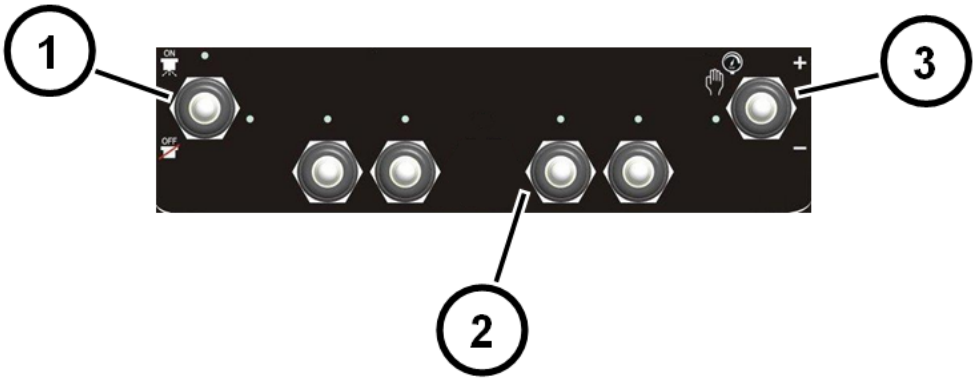
The system is supplied with pre-drilled mounting bracket. It is provided for a MED fastening system (optional) with dedicated accessories.
The system is able to shore up a maximum load of 2.5 Kg.



Picture 3 - Back side of the indicator

Application zone of self-adhesive labels with production codes, model, and serial number.

10.1.2 Layout of the switches

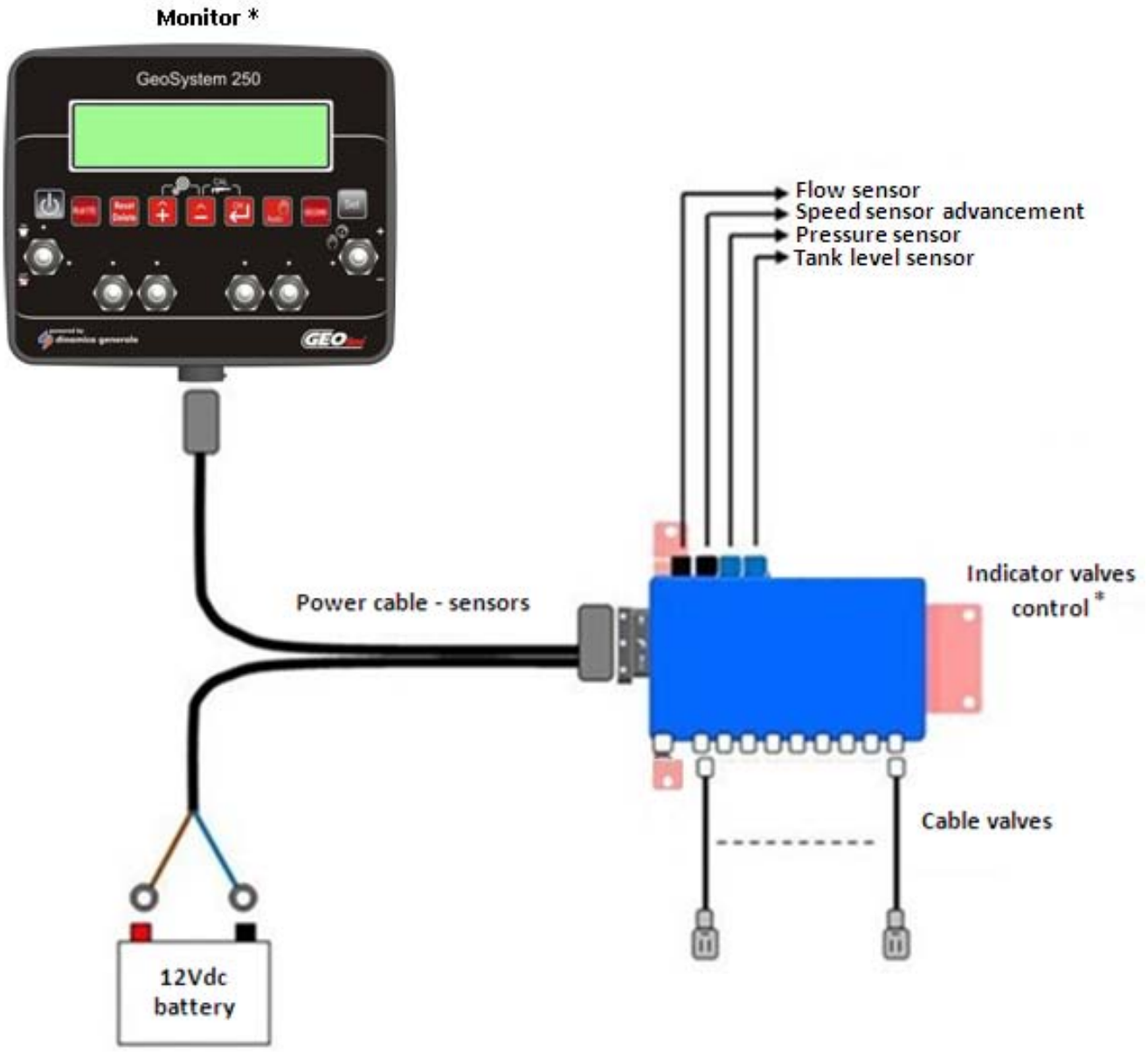


Picture 4 - Layout of the switches

1. **Control switch of the general valve**
2. **Control switches of the section valves**
3. **Volumetric valve command.**

10.2 CONNECTIONS SCHEME

10.2.1 Indicator GeoSystem 250 Orchard version 2/4 sections



* Reference product configuration table

Picture 5 - Scheme Orchard Version

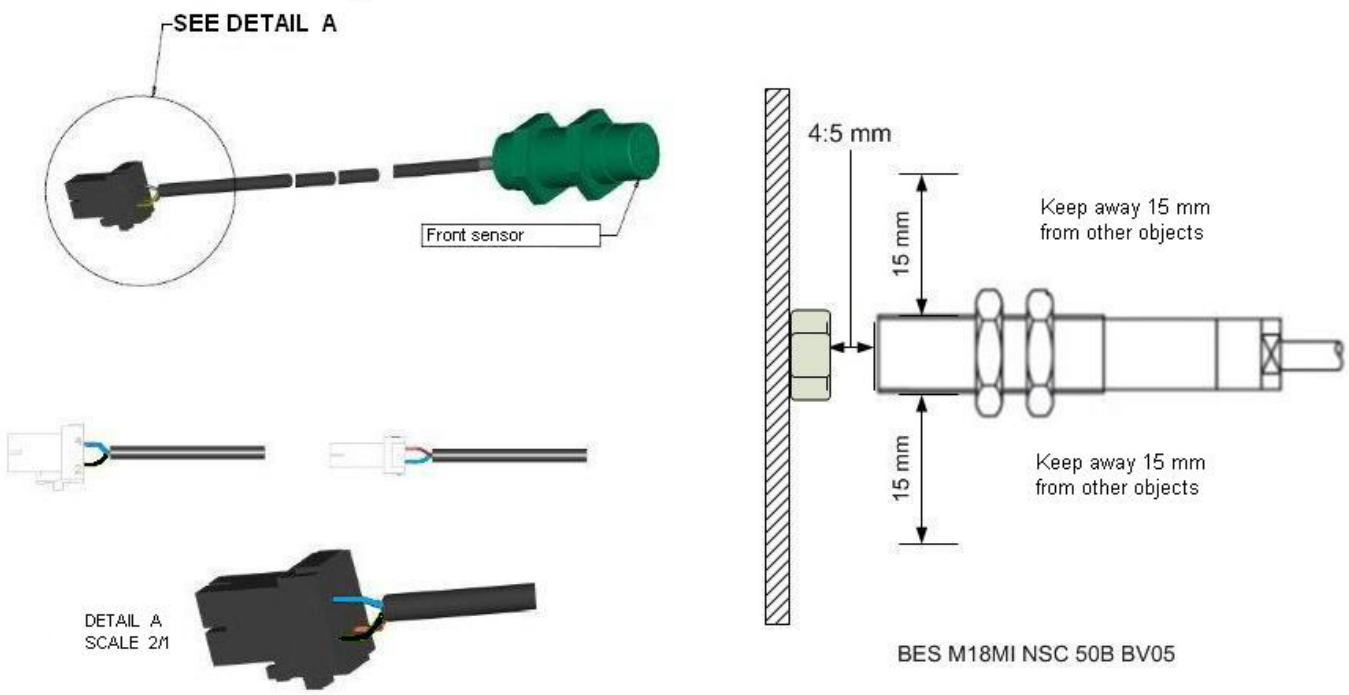
10.3 COMPUTER INSTALLATION

10.3.1 Advice for the location

The computer GeoSystem must be positioned in the command cabin of the farm vehicle taking care to observe the following precautions:

- Make sure that the monitor is not placed in areas subject to vibrations or crashes, this could damage the equipment or activate the buttons unintentionally;
- Fix the device in a place that is visible and easy to reach with your hands.
- The monitor should not obstruct the movement or limit the control visibility.

10.4 SPEED SENSOR INSTALLATION



Color	Unsheathe	Termination	Connection point
Blue	30 mm	Stripped 4 mm	4
Brown	30 mm	Stripped 4 mm	1
Black	30 mm	Stripped 4 mm	2

Picture 6 - Proximity Installation

10.4.1 Advice for the location

The speed sensors must be positioned taking care to observe the following precautions:

- Install the sensor at 4-5 mm away from the body to detect;
- Do not install the sensor body too near to other metal objects that may affect the operation of the detector.

10.5 FLOWMETER INSTALLATION

Color	Unsheat	Termination	Connection	Feature
Red	30 mm	Unsheat 4 mm	1	V+
Green	30 mm	Unsheat 4 mm	2	INP
Black	30 mm	Unsheat 4 mm	4	V-

Picture 7 - Flowmeter Installation

10.6 DRIVER BOX W INSTALLATION

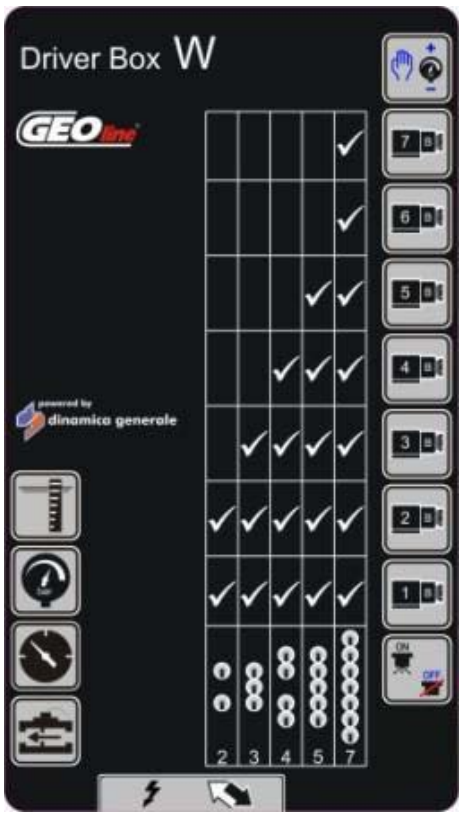
10.6.1 Advice for the location

The Driver Box W is installed on the trailer and it also supplies the indicator (located on the cab of the farm vehicle).

The Driver Box W must be connected to a power supply (12Vdc) sufficient to drive the added valves. The connection cable, between the box and the power supply, is long 3,5m and has 2 eyelets M8 on the 2 wires (+ and -).
The power supply must be protected with a 10A fuse.

10.6.2 Cables connecting DRIVER BOX W

The Driver Box W performs the operations to the command valves group.
It has a series of interface connectors for sensors and actuators



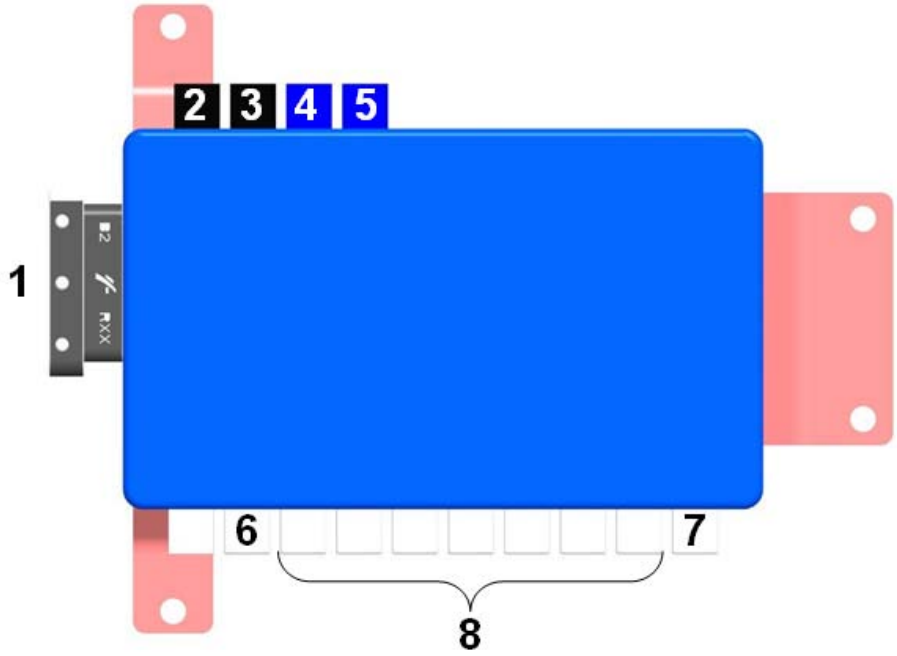
Picture 8 - Driver Box W

Features:

- It contains the wiring board with sensors and control outputs for the activation of the solenoid valves 2-wire.
- This board is connected to the indicator via a multipolar cable 5 meters long.
- 2 digital inputs (counter NPN):
  - speed sensor (including in the packaging)
  - flowmeter
- 2 analogical inputs 4-20 mA:
  - pressure sensor of the circuit
  - tank level sensor.

The cable allow to feed the power supply and it presents the signal cables for the communication and the sensor cables.

Layout connectors Driver Box W:



Picture 9 - Layout connectors Driver Box W

1. **Connector for the supply cable and the cable for the communication with the monitor**
2. **Connector for the Flowmeter cable**
3. **Connector for the speed sensor cable**
4. **Connector for the pressure sensor cable**
5. **Connector for the tank level sensor cable**
6. **Connector for the principal valve cable**
7. **Connector for the proportional valve cable**
8. **Connectors for command section valves**

10.7 CHECK HARDWARE INSTALLATION

Before to start with the use of GeoSystem 250 check the correct installation of each component:

- Check that the connectors are in the right locations
- Check that the cables have the right length
- Check that all screws are tight
- Check the polarity and the supply voltage

GeoSystem must be powered directly from the battery, it must not be connected to an outlet controlled by a master key.

In case of use of groups of valves equipped with a calibrated return, the correct functioning of GeoSystem is guaranteed only by an accurate calibration of all sensors and a proper calibration of the return flows.

11 INTERFACE DESCRIPTION OF INDICATOR

11.1 TABLE LIST OF BUTTONS AND SWITCHES AND THEIR FUNCTIONS

Monitor with alphanumeric display, buttons and command switches

Picture 10 – Indicator with 2 sections

Picture 11 – Indicator with 4 sections

CONTROL KEYS, SELECTION OR MODIFICATION

ON / OFF key:
Turn on / off the indicator

RATE key:
It is used to temporarily change the value of the amount of flow.
The value is not stored, taking up the current work (Set key) is reset to the original value.

Key command:
- Allows to returns to the previous menu
- Reset the percentage of increase / decrease of the value distribution
- Allows to reset the counters of the current treatment

UP key:
- It flows through the individual entries to the previous menu
- Increase the value of the parameter

During the modification of parameters, pressing the button permit to increase quickly the input values

---

DOWN key:
- Scrolls through the individual items through to the next menu
- Decrease the value of the parameter

During the modification of parameters, pressing the button permit to decrease quickly the input values

---

Confirm key:
- Confirm the access to the selected menu or parameter value previously modified
- Holding down this button for more than 2 seconds, it permit to display the values of the stored treatments

---

Command key:
Enable / disable the automatic adjustment of the distribution

---

ROW key:
It is used to temporarily change the value of the width between rows.
The value is not stored, taking up the current work (Set key) is reset to the original value.

Command key:
Allows to enable the menu of the working parameters.

11.2 MENU STRUCTURE

GeoSystem 250 menu are shown in the figure, in order to enter in the various items press the buttons or combinations of buttons located on the front panel of the monitor.

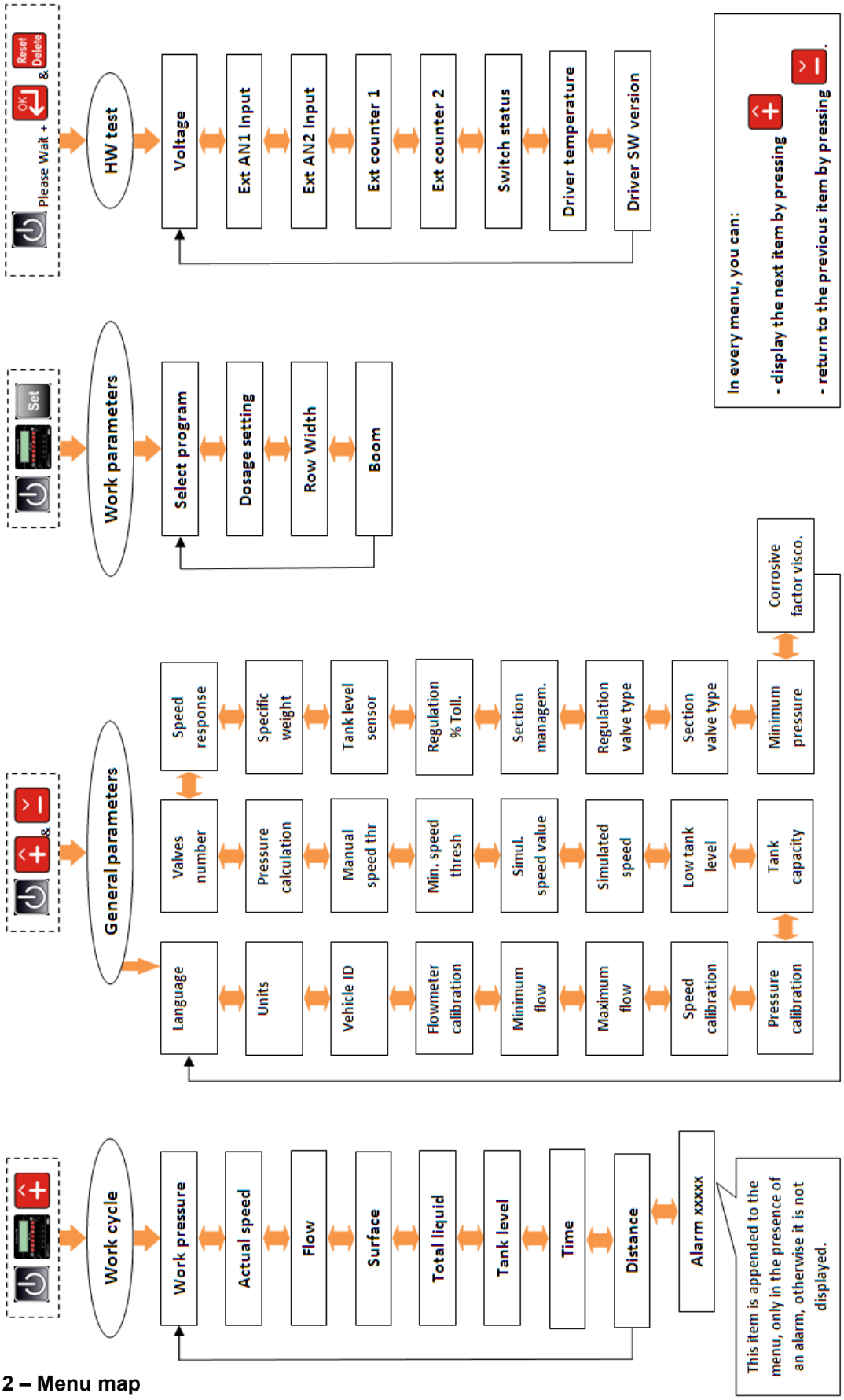
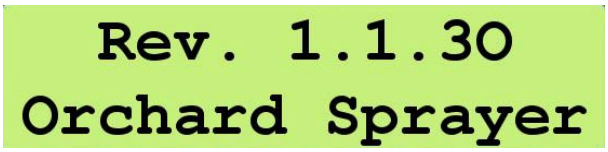
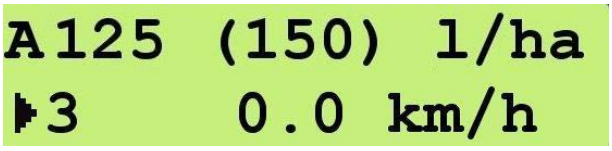
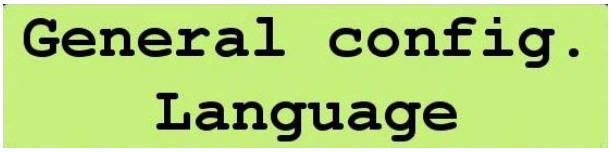
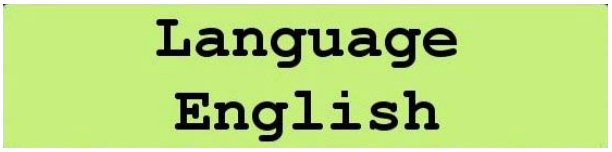


Figure 12 – Menu map

11.3 CONFIGURATION GENERAL PARAMETERS

Allows to set the parameters necessary for the proper operation of the indicator.

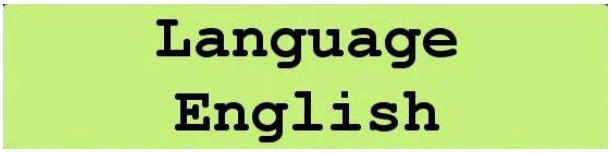
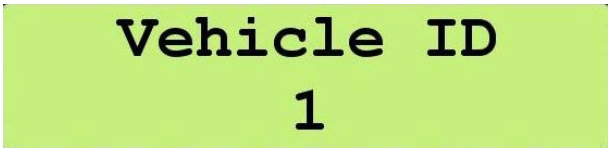
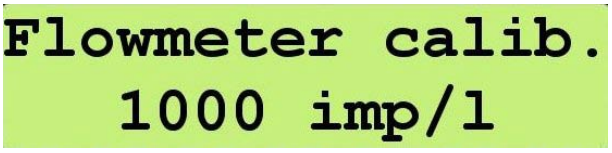
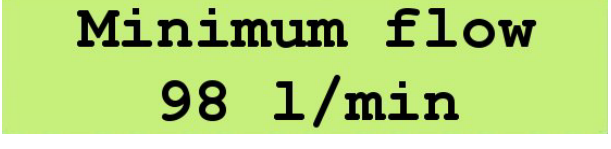
1	Turn on by pressing .	
2	The first message “TECOMEC GeoSystem 250” will appear on the display	
3	It shows the Firmware revision and the system name: Orchard Sprayer.	
4	Then, it appears the message “Please Wait”	
5	The working values appear.	
6	Keep pressing simultaneously and in order to enter in the configuration menu.	
7	Scroll through the menu items using the and keys.	
8	Press the key in order to modify the parameter: through the and keys is possible to change the value.	

If the fields contains default values or names, they will be displayed recursively by pressing and keys.
If the input value is numeric, it will be increased or decreased according to the duration of the key press with an exponential interval.

It is possible to cancel the current selection or return to the previously menu by pressing the

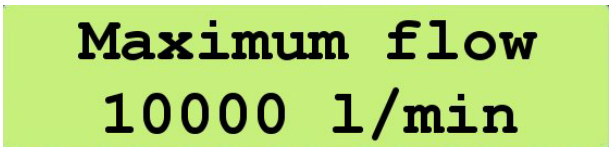
key.

11.3.1 LIST OF MENU ITEMS OF GENERAL CONFIGURATION

1	**Language:** Italian/English/Spanish/German/French.	
2	**Units:** Metrics (l/ha, Km/h, bar) / US (GPA, mph, psi).	
3	**Vehicle identification:** (1-5) it identifies the vehicle on which the system is installed. * By entering this configuration, you set the parameters for that particular vehicle (in this example: vehicle 1).	
4	**Flowmeter calibration:** It specifies how many pulses arrive to the flowmeter per amount of liquid sprayed. 1-5000 pulse/liter (Metric) or pulse/USG (gallon) (US).	
5	**Alarm threshold minimum flow:** 0-10000 l/min (Metric) or USGpm (gal/min) (US)	

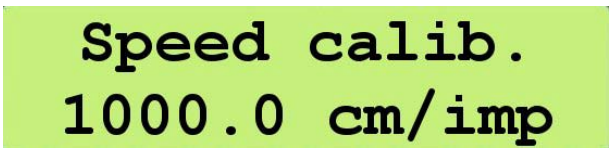
6 **Alarm threshold maximum flow:**

0-10000 l/min (Metric) or USGpm (gal/min) (US).



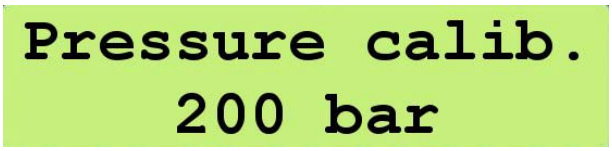
7 **Speed sensor calibration:**

2 mode: Constant wheel = distance traveled (cm or inches) / (number of pulses per revolution * wheel speed) or Automatic over a distance of 100 meters it is acquired pulse count.



8 **Sensor pressure calibration:**

0-200 F.S. value (bar or psi).



9 **Tank capacity:**

0-10000 liter (Metric) or USG (gal) (US).

10 **Alarm threshold minimum tank level:**

0-10000 liter (Metric) or USG (gal) (US).

11 **Simulated speed:**

Yes/No.

12 **Simulated speed value:**

0-50 Km/h (metric) or mph (U.S.)

13 **Minimum speed threshold:**

0-50 Km/h.
Below this value, it stops the spraying.

14 **Manual speed threshold:**

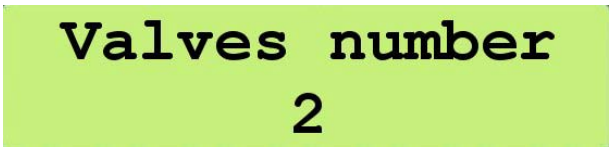
0-50 Km/h.
Below this value, it is not carried out the automatic management (only manual).

15 **Pressure calculation:**

Yes/No.

16 **Number of section valves:**

2, 4



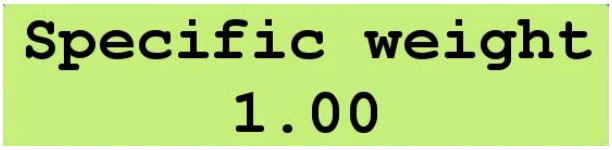
17 **Sensitivity to change in velocity:**

it changes the response time of the flow rate control in function of the speed, from the value 1 (fast) to the value 5 (slow).

By increasing this value, you will increase the precision but you will reduce the speed variation.

18 **Specific weight liquid tank:**

Only if the presence sensor level = YES, it allows to calculate the level of the tank in function of the specific weight of the liquid inside.



19 **Presence sensor level:**

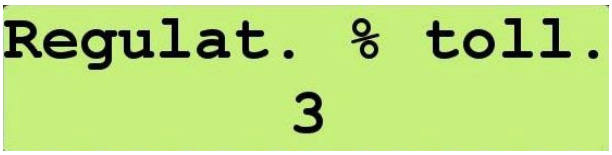
If you choose YES, the measured level is used in the replenishment procedure of the tank,. If you choose NO, it shows the pre-setting value.

Press the

button to fill in the new value.

20 **Percentage value of the display tolerance:**

It determines the sensitivity to display.



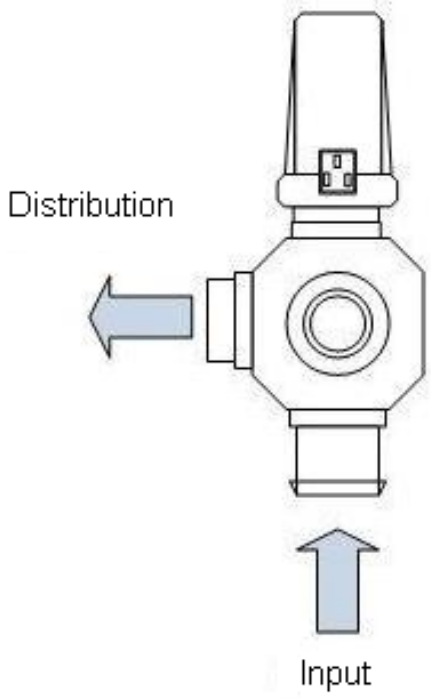
21 **Section valves type:**

- It is dependent (D) if, by closing the general valve, the other valves are closed; the led are switch off with the switches in any position. By re-activating the general valve, the other valves are re-activated and the switches are in ON position
- It is independent (I) if the section valves stay opened also if the general valve is closed.

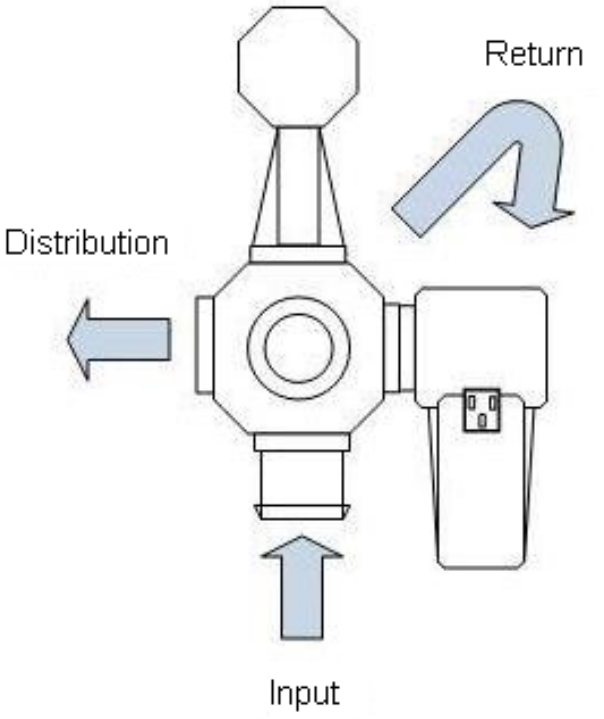
22 **Regulation valve type:**

Bypass / Throttling

Reg. valve type Bypass



Picture 13 - Throttling



Picture 14 - Bypass

23 **Section valve type:**

ON-OFF / Metered

Sect.valve type Metered

24 **Minimum pressure:**

0-200 bar

After 30 seconds with a value below the minimum pressure, an alarm is generated..

Minimum pressure 100 bar

25 **Viscosity corrective factor:**

Value of the corrective factor of the flow in function of the viscosity of the liquid.

Corr.fact.visco. 10.00

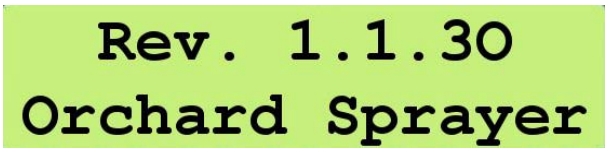
11.4 CONFIGURATION WORKING PARAMETERS

It allows to set all the working parameters of each single vehicle.

1 Turn on by pressing .

2 The first message “TECOMEC GeoSystem 250” will appear on the display.

3 It shows the Firmware revision and the system name: Orchard Sprayer.

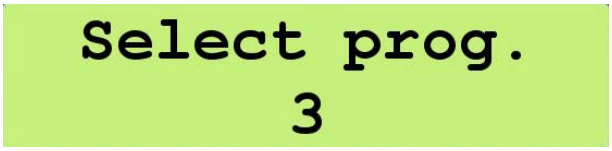


4 Then, it appears the message “Please Wait”.

5 The working values appear on the display.

6 Press

key in order to enter in the working selection/configuration menu.



7 Press the and keys in order to choose the type of work and confirm pressing

key.

It is possible to configure and choose up to 10 different types of work.

8 Keep pressing again the

key to pass through the following programs.

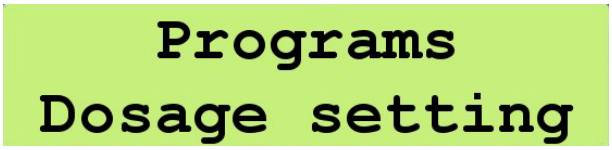
It is possible to cancel the current selection by pressing

key.

11.4.1 LIST OF ITEMS OF WORKING PARAMETERS

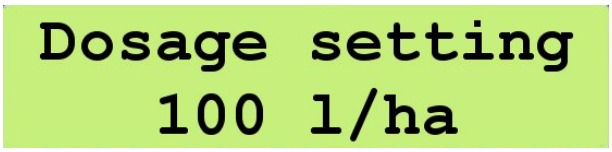
1 **Dosage setting:**

it permits to set the current value of the amount of liquid per unit of surface (liters per hectare).



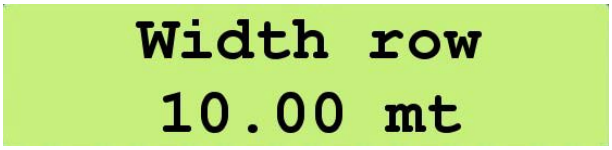
2 Press the

button to enter in the parameter and to set the value using the and keys.



3 **Row Width:**

It allows to set the value of row width in function of corresponding value.



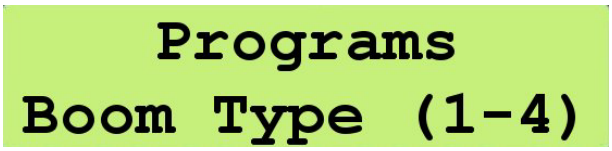
4 **Boom:**

It allows to set the identifier of the boom.

You can choose the value from "A" to "J"

If the parameter "Number of Valves" is equal to 4, the voices relating to Boom are 2:

1. **Boom Type (1-4)**
2. **Boom Type (2-3)**



More information to paragraph 11.7

11.4.2 EXECUTION WORKING CYCLE

It concerns the data management during the operating cycle. The indicator performs, according to the parameters configured, the acquisitions of the measures on the various sensors and the adjustment required.

1 Turn on the indicator by pressing .

2 The current dosage values appears and, in parentheses, those specified. In the bottom line the speed of advancement of the vehicle.

This visualization is available during the work.

3

The indicator displays the single values measured and calculated through & keys.

11.4.3 LIST OF AVAILABLE VALUES IN THE WORKING CYCLE

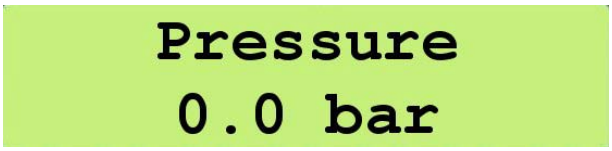
1 **Current value of the pressure**

It is displays only in this situations:

- Value of pressure calibration ≠ 0

or

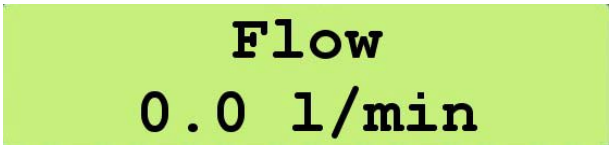
- Calculation of the pressure = YES

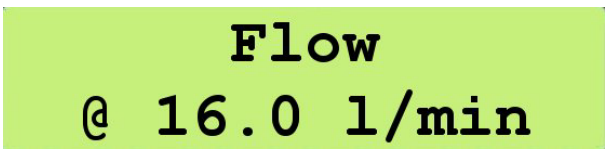


2 **Current value of the speed**

3 **Current value of the flow rate in liters / minute (or gallons / minute)**

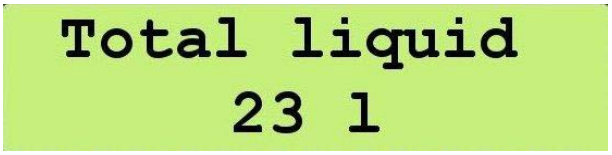
The sign “@” indicates that the represented flow value is calculated and it is not originate from the reading of the specific sensor. This happens if and only if the parameter “Section valve type” is set as “Metered”.





4 **Extension of the treated area since the beginning of treatment**

5 **Total of the liquid sprayed since the beginning of treatment**



6 **Current level of the tank:**

this parameter allows to do the 2 following operations.

Press the

key if you want to

modify the tank value using the
and
keys.

Press again the

key to confirm the value.

During the increase of the value, if you keep pressed the
key without releasing it, the value will increase and after 30 units it will pass to tens to accelerate the operation.

Keeping pressed the

key for 5 seconds to set the initial tank capacity (see the Tank Capacity parameter).

If the level sensor parameter is YES the value set will be the level measured by the sensor. After the 5 seconds a massage appears : Completed!

7 **Duration of the last treatment (hh:mm)**

8 **Traveled distance since the beginning of the last treatment (Km)**

9

At the end of the menu, you return to the initial display of the current dosing and those specified.

10 Press and hold the Reset Delete key for 5 seconds in order to reset, anytime, all counters related to the ongoing treatment.

After the 5 seconds, a message appears: Completed!

Release the Reset Delete key before the 5 seconds to cancel the reset.

11.5 WAY OF CALIBRATION AND BOOM CONFIGURATION

These operations must carried out when the treatment is not active (in manual mode and with all the switches in the OFF position).

- NOZZLE CALIBRATION:

It allows to define the characteristics of the type of nozzle used (liter/minute) in function of the pressure (bar). It is possible to choose from a set of pre-configured identifying marks (ISO standard) or to define new ones.

- TANK LEVEL CALIBRATION:

It sets the calibration points related to the level sensor of the tank.

- SPEED SENSOR CALIBRATION:

It calculates the rate constant based on a known distance to travel (100 m in EU and 300 feet in US).

- SPRAYING BOOMS CONFIGURATION:

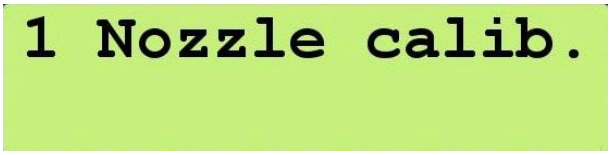
It allows to define the number and the type of nozzles for each type of spraying booms.

1 Turn on the indicator by pressing .

2 Keep pressing simultaneously and keys.

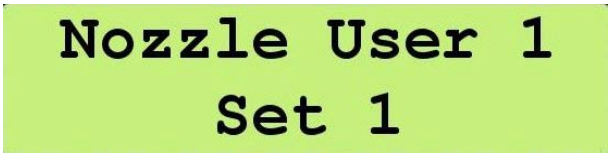
Slide the 4 voices of calibration through and keys.

3 **<u>NOZZLE CALIBRATION</u> (max 8).**

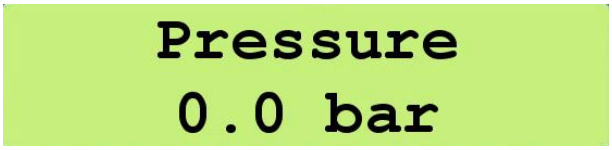


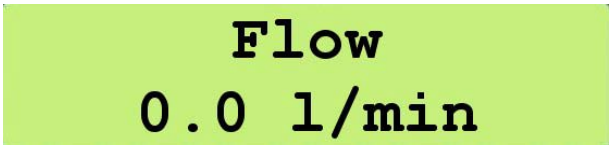
4 Press the key to enter in the nozzle configuration.

5 Press again the key to set up to 5 pairs of calibration values (Set 1-5) related to the nozzle.



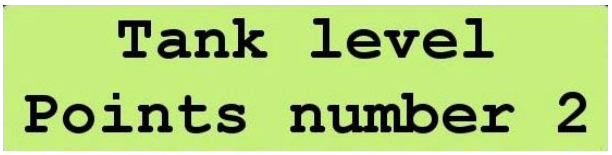
6 Press again the key to set the Pressure and the Flow Rate using the and keys.



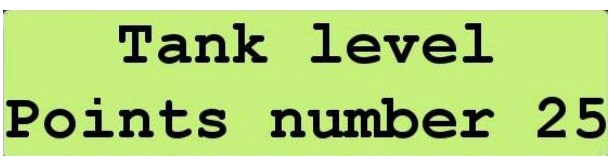


7 **<u>TANK LEVEL CALIBRATION</u>**

8 Press the key in order to enter in the tank configuration and to set the calibration points.



It is possible to define a minimum of 2 calibration points up to a maximum of 25.



9	Press again the OK key in order to insert the Tank level in liters using the + and − keys. Pour clean water (in the previously fitted amount of it) into the tank and confirm it with the OK key in order to move to the next value.	Tank level 1 75 l
10	Definition of the second value. Completely repeat the operations of the step 9.	Tank level 2 200 l
11	 Perform the steps 9 and 10 until the definition of all the calibration points you want to set (max 25).	
12	Press the OK key in order to finish the calibration. If everything is successful, it appears the message “Completed!”.	Completed!
13	**SPEED SENSOR CALIBRATION**	3 Speed calib.
14	Press the OK key to enter into the calibration.	
15	The message “Counter value” appears, it will increase as the tractor moves towards the finish line.	Counter value 0

16 Press the OK key when the tractor crossed the line (100 m in EU and 300 feet in US) in order to complete the calculation of the speed constant.

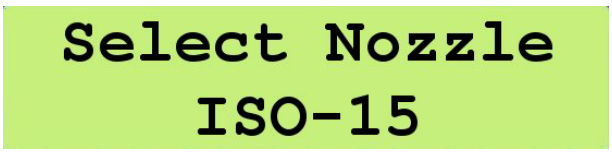
17 **BOOM CONFIGURATION**

18 Press the OK key in order to select the type of boom that identifies with the character from “A” to “J”.

19 Press again the OK key in order to select the type of nozzle:

ISO, ATR, MGA or USER

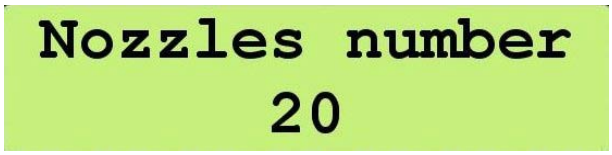
See table to paragraph 19, 20, 21



20 Press again the OK key in order to select the type:

{0, "ISO-01"},	{0, "ATR-White"},	{0, "MGA-White"},
{1, "ISO-015"},	{1, "ATR-Lilac"},	{1, "MGA-Golden"},
{2, "ISO-02"},	{2, "ATR-Brown"},	{2, "MGA -Orange"},
{3, "ISO-025"},	{3, "ATR-Yellow" },	{3, "MGA-Green"},
{4, "ISO-03"},	{4, "ATR-Orange"},	{4, "MGA-Yellow"},
{5, "ISO-04"},	{5, "ATR-Red"},	{5, "MGA-Lilac"},
{6, "ISO-05"},	{6, "ATR-Grey"},	{6, "MGA-Blue"},
{7, "ISO-06"},	{7, "ATR-Green"},	{7, "MGA-Red"},
{8, "ISO-08"},	{8, "ATR-Black"},	
{9, "ISO-10"},	{9, "ATR-Blue"},	
{10, "ISO-15"},		
{11, "ISO-20"},		

21 Press again the OK key in order to select the number of nozzle in the boom (da 0 a 200) .



22 Press the Reset Delete key in order to return to the previous menu.

11.6 VALUE OF SOFTWARE PARAMETERS

Limit values of the setting software parameters.

Parameter	Description	Min. / U.M.		Max. / U.M.		Note
Language	Message language	-		-		ENG/ ITA/SPA/ DEU/FRA
Unit	Used metric system	l/ha, Km/h, bar o GPA, mph, psi				Metrics/ US
ID Vehicle	Vehicle on which the system is installed	1		5		
Flowmeter Calibration	Constant Flowmeter Value	1 imp/l	4 imp/USG	5000 imp/l	18927 imp/USG	Metrics/ US
Minimal flow	Alarm threshold minimum flow	0 l/min	0 USGpm	10000 l/min	2642 USGpm	Metrics/ US
Maximum flow	Alarm threshold maximum flow	0 l/min	0 USGpm	10000 l/min	2642 USGpm	Metrics/ US
Speed Calibration	Speed sensor calibration	0.0 cm/imp	0.0 in/imp	6000.0 cm/imp	2362.2 in/imp	Round pulse Num. * wheel rounds
Pressure Calibration	Pressure sensor calibration	0 bar	0 PSI	200 bar	2901 PSI	Value of bottom scale
Tank capacity	Value the tank can contain	0 l	0 USG	10000 l	2642 USG	Metrics/ US
Minimum Tank level	Alarm threshold minimum level tank	0 l	0 USG	10000 l	2642 USG	Metrics/ US
Simulated speed	Simulated speed	No		Yes		
Simulated speed value	Simulated speed value	0 km/h	0 mph	50 km/h	31 mph	Metrics/ US
Threshold minimal speed	Value below which the spraying action is interrupted	0 Km/h	0 mph	50 Km/h	31 mph	Metrics/ US
Threshold manual speed	Value below which the automatic management is not effectuated	0 Km/h	0 mph	50 Km/h	31 mph	Metrics/ US
Pressure calculation	Pressure calculation	No		Yes		
Number of valve	Number of valve	2		4		2, 4
Speed response	Sensitive to the speed variation	1		5		1 fast 5 slow
Specific weight	specific weight of tank liquid	0.00		10.00		

ENGLISH

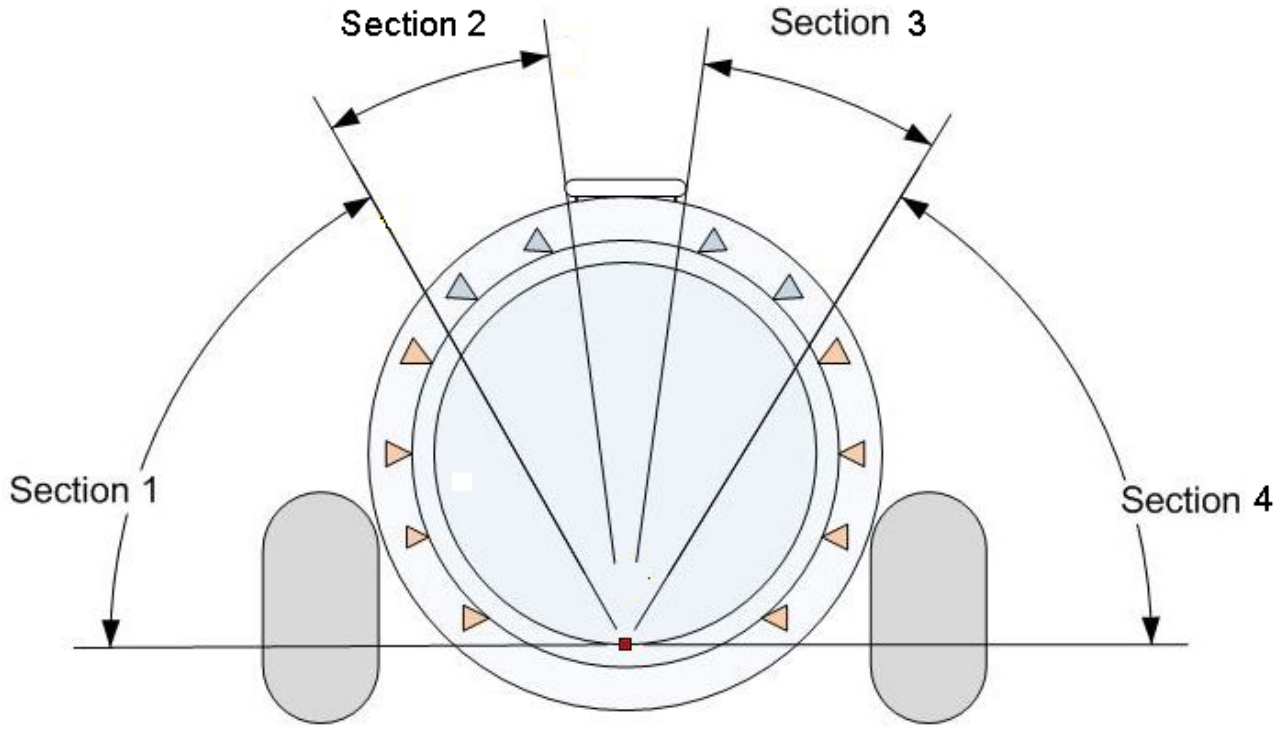
Level sensor	Level sensor	NO		Yes		
% tolerance of regulation	Value % of tolerance	0 %		20 %		
Sections management	Sections management	D		I		
Regulation valve	Type regulation valve	Bypass		Throttling		
Section valve	Type section valve	On-Off		Calibrated		
Minimum pression		0 bar	0 psi	200 bar	2901 psi	
Corrective viscosity factor	Corrective viscosity factor	0.00		10.00		

Table 4 - General Parameters

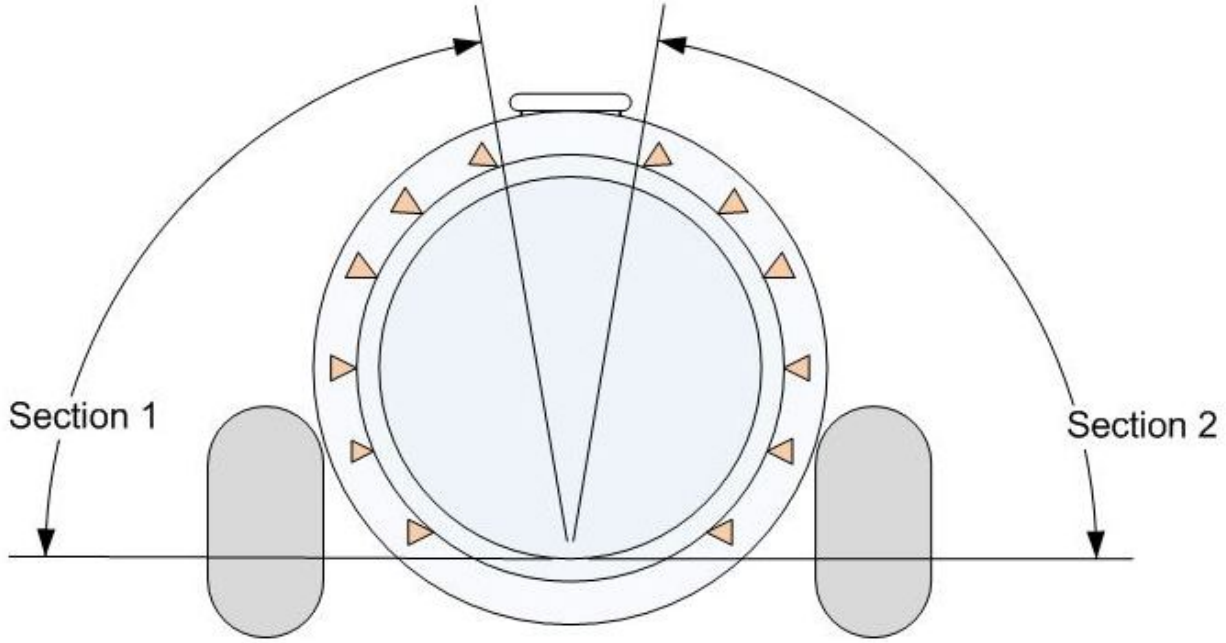
Parameter	Description	Min. / U.M.		Max. / U.M.		Note
Working selection	Type of work	1		10		
Dosage setting	Current value of the amount of liquid	0 l/ha	0 GPA	10000 l/ha	1069 GPA	Metrics/ US
Width row	Distance between the rows	0.00 mt	0.00 ft	100.00 mt	328.08 ft	Metrics/ US
Boom type	Boom type associated to sections	A		J		

Table 5 - Working Parameters

11.7 BOOM SECTION



Picture 15 – Boom section. Distribution with 4 sections



Picture 16 – Boom section. Distribution with 2 sections

12 HW TEST

It allows to effect the hardware test.

This test can be carried out only at starting.

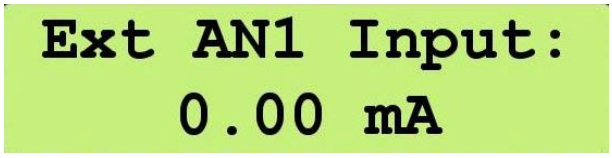
1 Turn on the indicator by pressing .

2 After viewing the software revision, when the message “Please Wait” appears, press simultaneously the and keys.

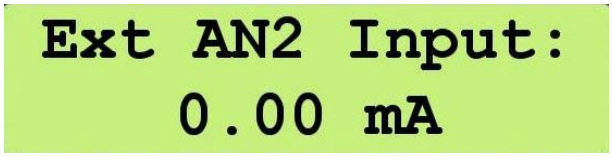
3 The message “Test HW” appears.

4 The value of Voltage appears and it is possible to slide the following values through and keys.

5 The next data is the value of the analog input 1 of the Switch Box board corresponding to the pressure sensor.



6 The next data is the value of the analog input 2 of the Switch Box board corresponding to the tank level sensor.



7	The next data is the value of the external counter 1 corresponding to the input of the flowmeter. 	Ext counter 1: 0 Hz
8	The next data is the value of the external counter 2 corresponding to the input of the speed sensor. 	Ext counter 2: 0 Hz
9	The next data indicates the status related to the switches. 0 = OFF 1 = ON By actuating the switches, the state will change from 0 to 1 and turning them off will return to 0.	Switch status: 000000000000 Switch status: 111111001010
10	The next data corresponds to the temperature inside the box driver.	Driver temperat: 0 C
11	The next data corresponds to the SW revision of the valve driver board.	Driver SW vers. 1.0
12	Press the key in order to return to the normal operation of the indicator. 	
13	 To repeat the TEST HW it is necessary to switch off and on again the indicator.	

13 USE OF GEOSYSTEM 250

13.1 DISPLAY

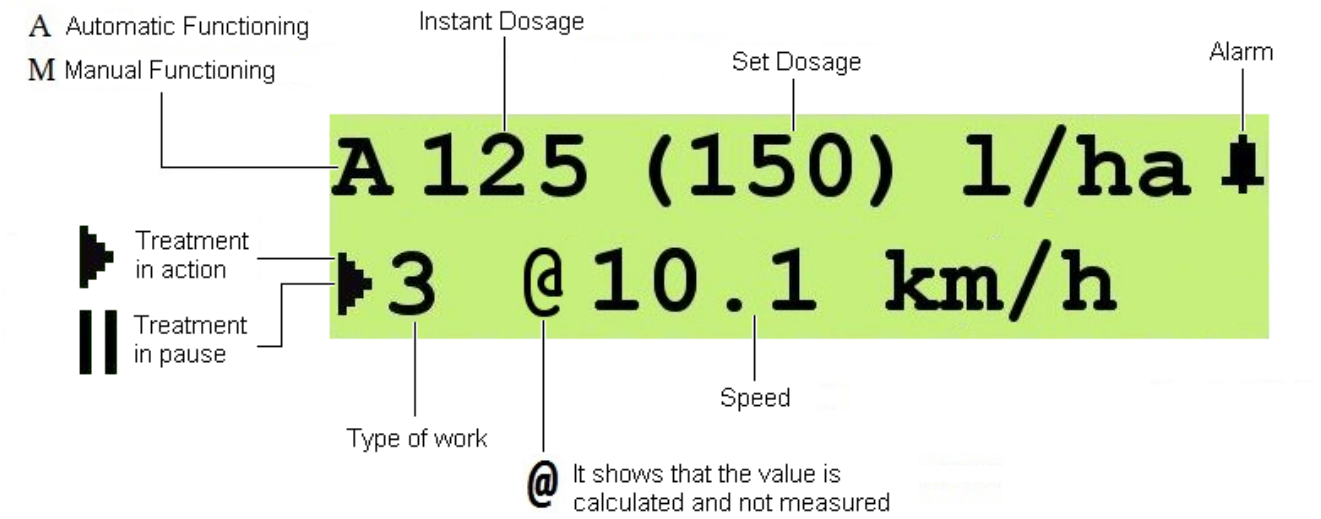


Figure 17 -Display

13.2 DEFINITION OF TREATMENT

The term treatment means the set of data recorded during an activity of weeding or sprayer. The working parameters recorded by GeoSystem are stored in a tail. The tail can store a maximum of 20.
The data of each treatment can be visualized through the appropriate keys.
Every time you start a new treatment the data of the current treatment are inserted in the tail.
The treatment number 1 is the last treatment saved.
Treatment number 2 is the second last treatment saved and so on.
All treatments inserted in the queue slip of a position at the moment of every saving.
When the tail is full, the recording of a new treatment causes the cancellation of the treatment less recent (that in twentieth position).
After the treatment n° 20, appears the value “Total”, that refers to the historical data related to all the treatments.

This value cannot be deleted, not even through the RESET procedure.

13.3 NEW TREATMENT

1 To start the recording of data on a new treatment, select a parameter of any work cycle, with the exception of the parameter: "Tank Level".

2 Press the Reset Delete key for 5 seconds.

3 By now, the counters are all reset.

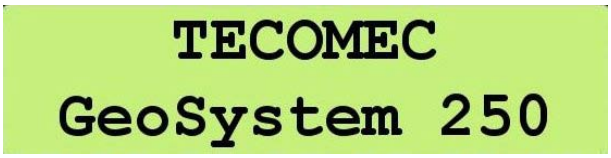
The parameter “Tank level” is a special parameter:

If it is selected, the pressing of the button for 5 seconds DO NOT prepare the system for a new treatment but for a new filling of the tank.

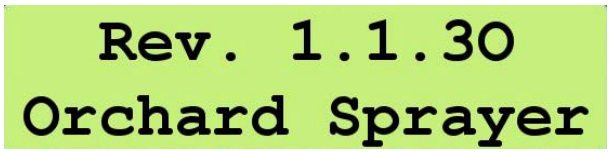
13.4 TURNING ON GeoSystem 250

1 Turn on the indicator by pressing .

2 The message “TECOMEC GeoSystem 250” will appear on the display and immediately the software revision.



3 It shows the Firmware revision and the system name: Orchard Sprayer.



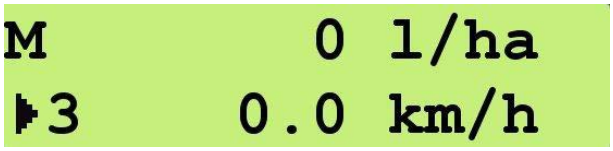
4 After which it appears the message “Please wait”

5

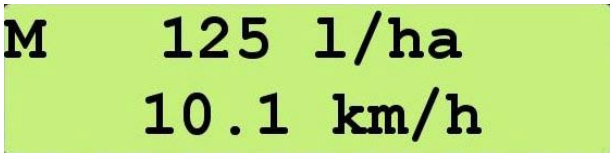
If the general valve is active (switch in ON position),when you are turn on the indicator, it will appear a message and then a sound of the buzzer to demand your attention.

Disable the switch to interrupt the alarm.

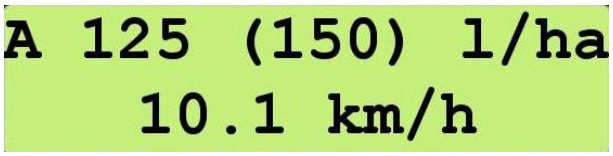
6 The working values appears on the display and, eventually, additional markings such as:



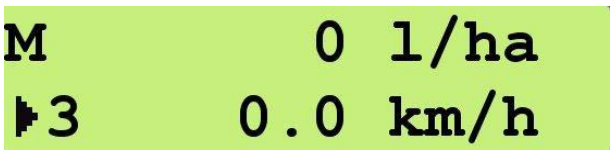
7 • **the character "M" before the current value of distribution "M 125 l/ha":** it signals that the indicator is in manual mode;



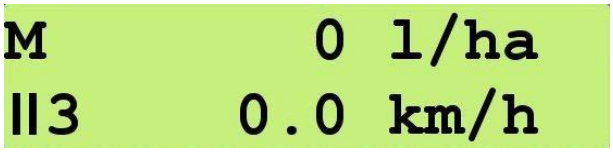
8 • **the character "A" before the current value of distribution "A 125 l/ha":** it signals that the indicator is in automatic mode.



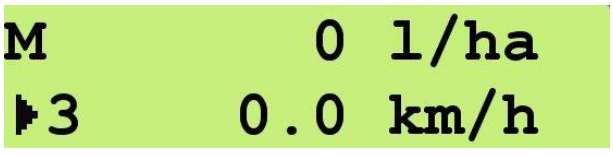
9 • **the sign "►"at the bottom left:** it signals that the treatment is in action**.**



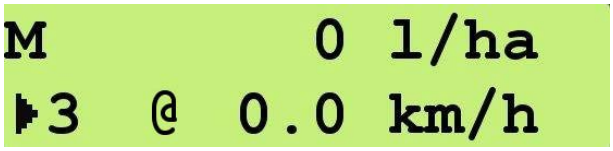
10 • **the sign "▌▐" at the bottom left:** it signal that the treatment is in pause.



11 • **the number "3" at the bottom left:** it identifies the type of work you are doing

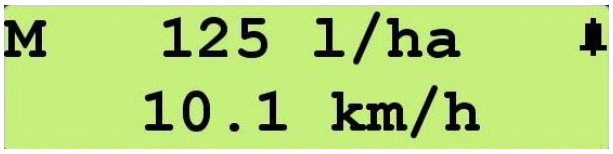


12 • **the sign "@":** it indicates that the data represented on the right is calculated or simulated and it is not originated from the reading of one specific sensor. E.g. the represented speed is a simulated value.



13

- **The symbol** **in the upper right:** it indicates the presence of an alarm;



14 At the starting, press simultaneously the

keys to reset all the parameters of the indicator to the initial values.

ENGLISH

13.5 TURNING OFF GeoSystem 250

1 Press the key in order to turn off the system.

2 Wait that the data of the last treatment will be saved.

During the turning off do not press any key and do not remove the power, until the control unit turns off.

Always use the appropriate button to turn off the computer, otherwise all the data relating to treatments and schedules will be lost.

13.6 PREPARATION

1 Make sure all the switches are in OFF position.

2 Turn on the indicator by pressing the key.

3 Set in GeoSystem the amount of the liquid that is in the tank.

4	To start the data recording of a new treatment, select a parameter of the any cycle work, with the exception of the parameter" tank level".	
5	The system store the treatment data in a tail of 20 elements.	
6	Press for 5 seconds the Reset Delete key to save the last data stored in the tail and to reset all the meters, prearranging the data recording of the new treatment you will do. N.B. if the level sensor is not present, pressing the key, you will reset all the working data, except the tank level that is recharged to the pre-set value during the configuration phase.	

13.7 AUTOMATIC FUNCTIONING

The automatic functioning is indicated by the letter A, situated on the left side of the display. The value between parenthesis is the dosage set by the user, GeoSystem 250 will drive the regulation valve looking for maintaining constant the dosage at the variation of the vehicle speed.

13.8 MANUAL FUNCTIONING

The manual functioning is indicated by the letter M, situated on the left side of the display. GeoSystem 250 will record the working data shown during the functioning.

13.9 TANK REPLENISHMENT DURING A TREATMENT

1	If the field to treat requires an amount of liquid higher than the amount of the tank, it will be necessary to fill once or more times the tank.	
2	At every replenishment you have to update the tank level (parameter: “Tank Level ”)	
3	Select the parameter: “Tank Level”	
4	Press for 5 seconds the Reset Delete key.	
5	The parameter is automatically updated with the maximum tank capacity value. (parameter “Tank capacity”)	

The parameter “Tank level” is a special parameter:

if you DO NOT select the parameter “Tank level” the pressure of the key for 5 seconds will prepare the system for a new treatment, resetting all the counters.

6	To modify the value, enter in modifying phase pressing the OK key and using the + and − keys to increase or decrease the value.	

13.10 TOTALIZERS

It allows to check the counters related to working.

13.10.1 READING TOTALIZERS

1 Turn on the indicator by pressing .

2 Press and hold the key for 3 seconds to access the statistics of the operating mode.

3 Shows the name of the totalizer and, at the bottom line, the total duration of the treatment.

4 Scroll the last 20 treatments through and keys.

The totalizer N° 1 relates to the treatment more recently while the totalizer N° 20 is the oldest one.

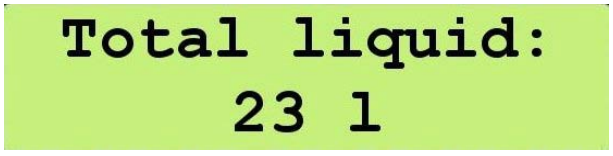
5 After the treatment n° 20, appears the total value that refers to the historical data related to the treatments.

6 Press the key to verify the individual counts of each totalizer.

Through and keys, display the values relating to the treatment carried out, such as:

- **The value of the treated area (ha)**

- **The value of the total liquid sprayed (l)**

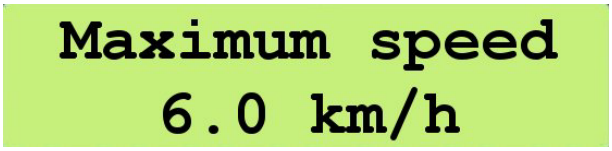


- **The traveled distance (Km)**

- **The duration of the treatment performed (hh:mm).**

- **Average speed (km/h)**

- **Maximum speed (km/h)**



13.10.2 RESET TOTALIZERS

1 The indicator stored the data of treatment in a tail of 20 elements.

2 Press and hold the Reset Delete key for 5 seconds in order to save the last data stored in the tail and in order to reset all counters, preparing the recording of the data related to the new treatment that will be performed.

Press OK key to confirm the reset or Reset Delete key to cancel.

If the level sensor is not present, pressing the reset button will reset all work data, except the tank level, which is reloaded to the preset value during configuration.

13.11 RECALL DATA OF TREATMENTS

1 Press for 3 seconds the OK key, in order to access to the menu that allows to visualize the tail of last 20 treatments performed.

2 Using the + and − keys in order to scroll the list of treatments. Press the OK key in order to access to the content.

14 ALARMS

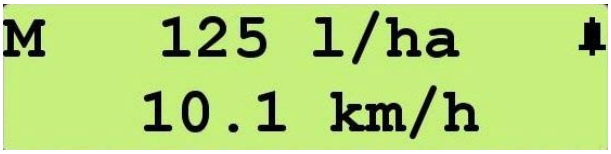
14.1 WARNING AND ALARMS

There are some warning and alarms to highlight unusual states that show anomaly functioning.
At the activation o fan alarm, you will hear the buzzer.

Press

key to disable it.

The active alarm state is highlighted by the sign on the right of the first line of the display.



14.2 LIST OF POSSIBLE ALARMS

1. Valve box alarm:
There is no communication between the indicator and the Valve Box.

2. Flow regulation alarm:

the indicator has to reach a flow set point value(l/ha), if it can not reach this value, the indicator gives a signal after a minute.

3. Tank empty alarm:

it gives this alarm when it reaches the minimum flow of liquid in the tank set with the parameter **Alarm threshold minimum tank level**

4. Minimum flow alarm:

The amount of sprayed liquid (l/min) is lower than the parameter value **Alarm threshold minimum flow**

5. Maximum flow alarm:

the amount of sprayed liquid (l/min) is higher than the parameter value **Alarm threshold maximum flow**

6. Low battery level alarm:

the battery level is lower than 9.0 Volts

7. Low pressure alarm**:**
The alarm is generated after 15 seconds with a pressure less than the parameter **Minimum pressure**

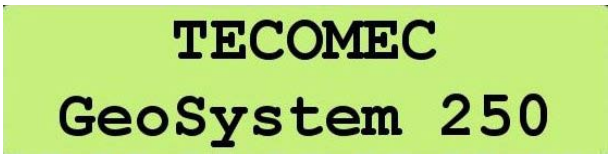
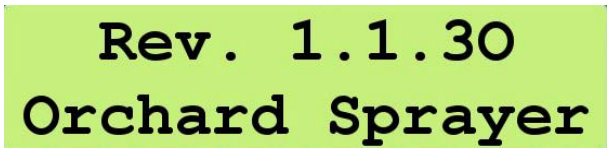
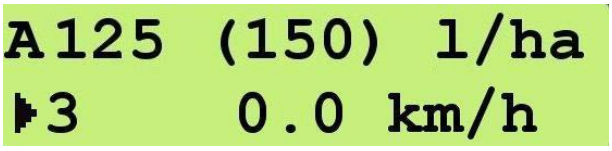
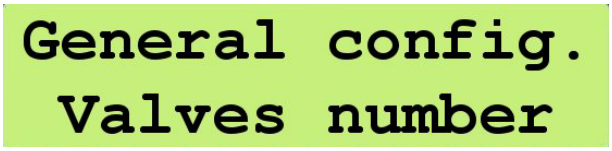
15 TROUBLESHOOTING

DISPLAY	CAUSE	SOLUTION
The display does not turn on	There is not power.	Check the connections on the power cable.
	The indicator is turned off.	Press the turning on button.
The valves can not be controlled	The valves are not connected.	Connect the connectors
A valve does not open	The valve has not power.	Check the electric connection and the functioning of the valve
The counting of the travelled distance shown on the computer is different from the real one.	Wrong programming	Check the connection with the speed sensor.
	The reset of the totalizer has not been effectuated	Reset the totalizer
The counting of the travelled surface shown on the computer is different from the real one.	Wrong programming	Check the bar width programming
	The reset of the totalizer has not been effectuated	Reset the totalizer
The instant pressure is not shown.	The indicator has not signal from the pressure sensor	Check the connections with the pressure sensor
	Wrong installation of the pressure sensor	Check the bottom scale programming for the pressure sensor
The instant pressure visualized is inaccurate.	Wrong programming	Check the bottom scale programming for the pressure sensor
	The pressure sensor is not calibrated	Do the calibration
	Wrong installation of the pressure sensor	Check the connections with the pressure sensor
The tank level visualized is inaccurate.	The level sensor is not calibrated.	Do the calibration. Repeat the level sensor calibration.
	Wrong installation of the level sensor.	Check the connection with the level sensor

Table 6 - Troubleshooting

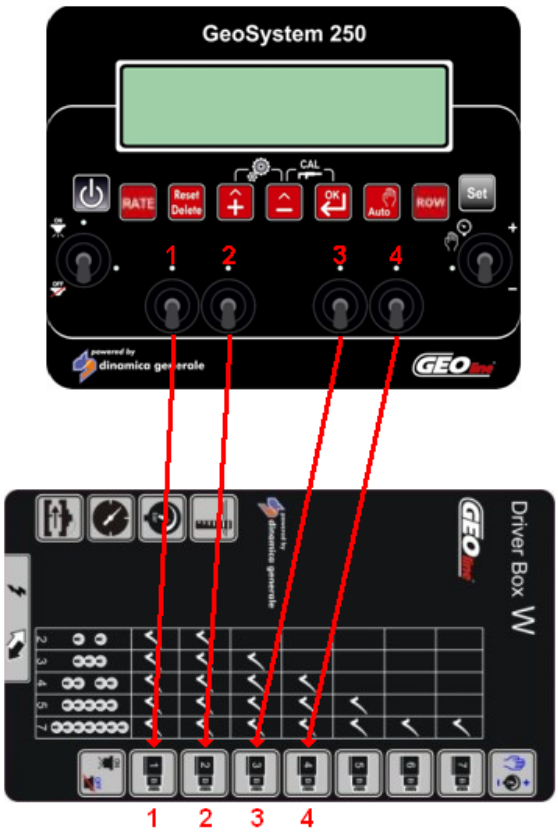
16 OTHER CONFIGURATIONS

16.1 GeoSystem 250 4OS INSTALLATION ON SPRAYER SYSTEM WITH 2 SECTIONS

1	Make sure the system is exactly connected as on picture 8 at page 10.	
2	In this step it is not important the sensor connection but the valve cable connection and the GeoSystem 250 driver box output connection.	
3	Make sure all the switches are in OFF position so turn on the indicator by pressing the key.	
4	It appears the message TECOMEC GeoSystem 250 on the display.	
5	It shows the Firmware revision and the system name: Orchard Sprayer.	
6	It appears the message “please wait”	
7	It appears the working values.	
8	Press simultaneously the and keys to enter into the configuration menu.	
9	Scroll up and down the entries of the menu using the and keys to arrive at the parameter “ number of valves”	
10	Press the key to enter into the configuration.	

Go to the next step to verify the operation of the valves otherwise skip to step number 15.

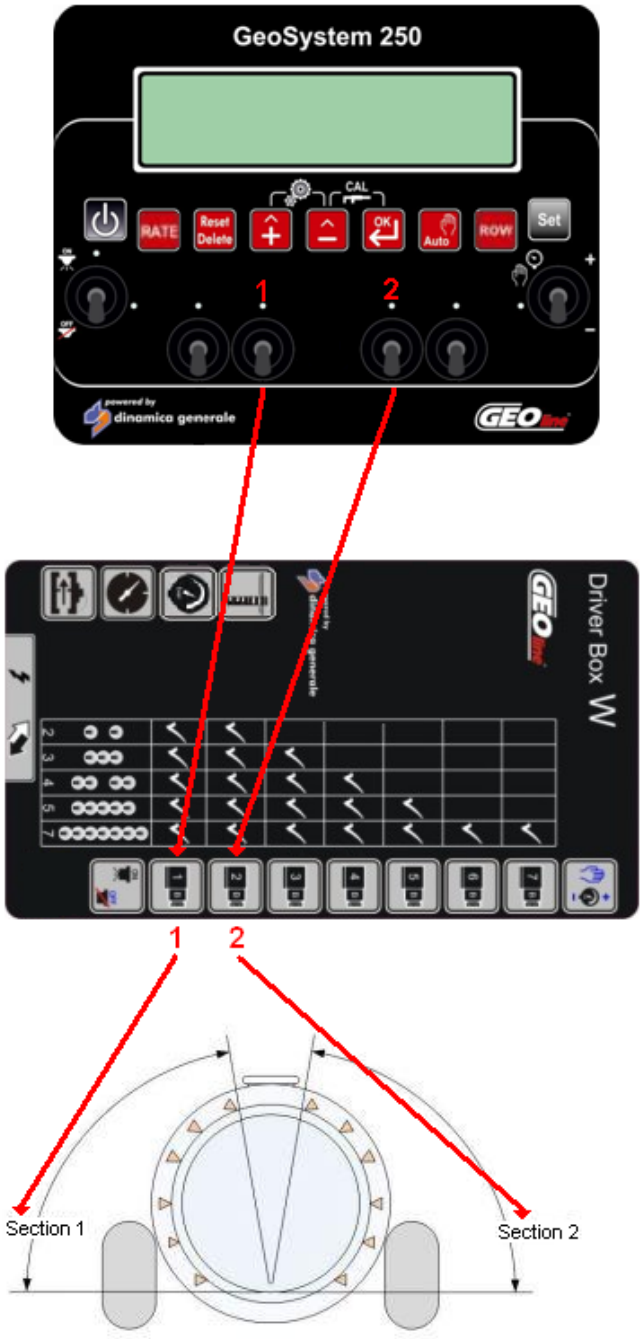
11	Set the number 4 and press the OK key to confirm.	Valves number X
12	It appears a new message " General config. Number of valves".	General config. Valves number
13	Press the Reset Delete key to exit and to launch again the indicator.	
14	When the indicator is on working mode, activate the switch number 1 (in ON position) and check the valve number 1 is working. Then, disable the Switch 1 (in OFF position) and try with the Switch number 2. Repeat the test for all the valves.	



Picture 18 - Use of 4 sections

15	If all the connected valves are working, enter again in configuration menu and set the valve number at 2.	Valves number X

16 At this point the indicator is working with only 3 connectors as indicated on picture:



Picture 19 - Use of 2 sections

17 CE CONFORMITY DECLARATION

Company: GEOline electronic

Address: Via Mondadori, 15
46025 Poggio Rusco (MN)
ITALY

DECLARES THAT THE PRODUCT:

Model:	GeoSystem 250 OS
Description:	Management system of distribution
Options:	All the configurations

is in conformity with all the essential requirements of European Directive 2004/108/EC, making with the following directives:

EMC for emission:

EN 61326-1
EN 55011(1999) – A1(2000) – A2(2003)

EMC for immunity:

EN 61000-4-2 (96) – A1 (99) – A2 (01)
EN 61000-4-3 (97) – A1 (02)
EN 61000-4-4 (96) – A1 (01) – A2 (01)
EN 61000-4-5 – (1997)
EN 61000-4-6 (97) – A1 (01)
EN 61000-4-8 (97) – A1 (01)

Reference to Standards Applied:
EN ISO 14982 (Electromagnetic compatibility - agricultural and forestry machinery.
Test methods and acceptance criteria)

18 GUARANTEE

The supplier guarantees, for 24 months from the delivery date, the good quality of materials used, the excellent construction and the steady functioning of the instrument they have manufactured and that bears the trademark or the production serial number. During the guarantee period the supplier undertakes to repair or replace, free supplier's head office, faulty parts due to poor materials or faulty construction, provided that such parts are delivered free port supplier's head office.
Shortcomings and defects due to incorrect use of instruments, inadequate maintenance, changes carried out without the supplier's approval, normal wear are not included in this guarantee.
Liability and compensations by the supplier due to direct or indirect damages to persons, objects or production, even as a consequence of faulty functioning of the supplied instruments or of material or construction defects, are not included in this guarantee.

NOTES:

GEOline electronic reserve itself the right to modify the contents of this manual caused by hardware and software implementations in order to a constant improvement of the product and so a better service to the user.

19 ISO TABLE

NOZZLE [l/min]					
bar	**4**	**8**	**12**	**16**	**20**
ISO-01	0.45	0.64	0.78	0.91	1.01
ISO-015	0.68	0.96	1.18	1.36	1.52
ISO-02	0.92	1.30	1.60	1.85	2.07
ISO-025	1.15	1.63	2.00	2.31	2.89
ISO-03	1.37	1.94	2.38	2.75	3.07
ISO-04	1.82	2.58	3.16	3.65	4.08
ISO-05	2.28	3.22	3.94	4.55	5.09
ISO-06	2.73	3.86	4.72	5.45	6.09
ISO-08	3.70	5.23	6.40	7.39	8.26
ISO-10	4.62	6.53	8.00	9.24	10.33
ISO-15	6.84	9.79	12.0	13.86	15.49
ISO-20	9.24	13.06	16.0	18.48	20.66

Table 7 - ISO table

20 ATR TABLE

NOZZLE [l/min]					
bar	**3**	**9**	**15**	**20**	**25**
ATR-White	0.22	0.38	0.45	0.52	0.58
ATR-Lilac	0.28	0.48	0.61	0.70	0.77
ATR-Brown	0.38	0.64	0.81	0.93	1.04
ATR-Yellow	0.57	0.97	1.25	1.44	1.61
ATR-Orange	0.77	1.32	1.69	1.94	2.16
ATR-Red	1.08	1.83	2.33	2.67	2.97
ATR-Grey	1.18	1.98	2.51	2.88	3.20
ATR-Green	1.40	2.35	2.99	3.42	3.80
ATR-Black	1.57	2.64	3.36	3.85	4.28
ATR-Blue	1.92	3.24	4.12	4.72	5.25

Table 8 - ATR table

21 MGA TABLE

NOZZLE [l/min]					
bar	**4.83**	**6.89**	**10.34**	**13.79**	**20.68**
MGA-White	0.25	0.29	0.34	0.40	0.50
MGA-Golden	0.33	0.39	0.46	0.56	0.63
MGA-Orange	0.50	0.59	0.68	0.82	0.88
MGA-Green	0.75	0.90	1.05	1.25	1.53
MGA-Yellow	1.00	1.20	1.42	1.65	2.03
MGA-Lilac	1.25	1.50	1.81	2.07	2.51
MGA-Blue	1.50	1.80	2.20	2.50	3.00
MGA-Red	2.10	2.55	3.10	3.50	4.30

Table 9 - MGA table

"QUICK REFERENCE" GeoSystem 250 OS

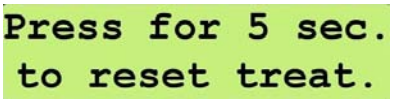
TREATMENT PREPARATION

1 To start the data recording of a new treatment, select a parameter of any working cycle, except the "level tank" parameter.

2 The system stores the treatment data in a tail of 20 elements.

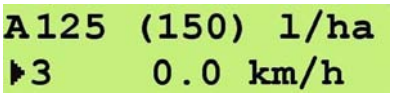
3 Press for 5 seconds the Reset Delete key to save the last stored data in the tail and to reset all the counters, prearranging the data recording of a new treatment you are going to do.

N.B: if the level sensor is not present, the pressure of the key will reset all the working data, except for the tank level which is reload to a pre-set value in configuration phase.



USE

1 Automatic functioning of the system: GeoSystem 250 shows and records the speed, flow, travelled distance, treated area, amount of sprayed liquid values and it operates in a active way on the propositional valve. Moreover, it constantly maintains the dosage value at the variation of the vehicle speed and of the number of the active section valves.



2 Press the Auto key to activate the automatic functioning until letter A appears on display and then, activate the wanted section valves.

3 Press the Set key to select the working values, if necessary.

4 Open the general valve and power up the tractor.

5 Place the switch upwards to increase the amount of sprayed liquid, downwards to decrease it.

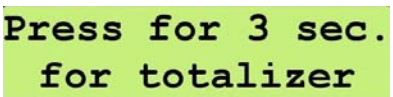
TANK REPLENISHMENT

1 If the treatment requires more chemical substance than how the vehicle tank can contains, the operator has the possibility to supply the tank with liquid and to eventually modify the insert quantity.

2 If the level sensor is not present, you have to manually set the tank level data.
In this case select the "level tank" data and, only in this case, press the Reset Delete key to modify the data which is reloaded at the pre-set value in configuration phase.

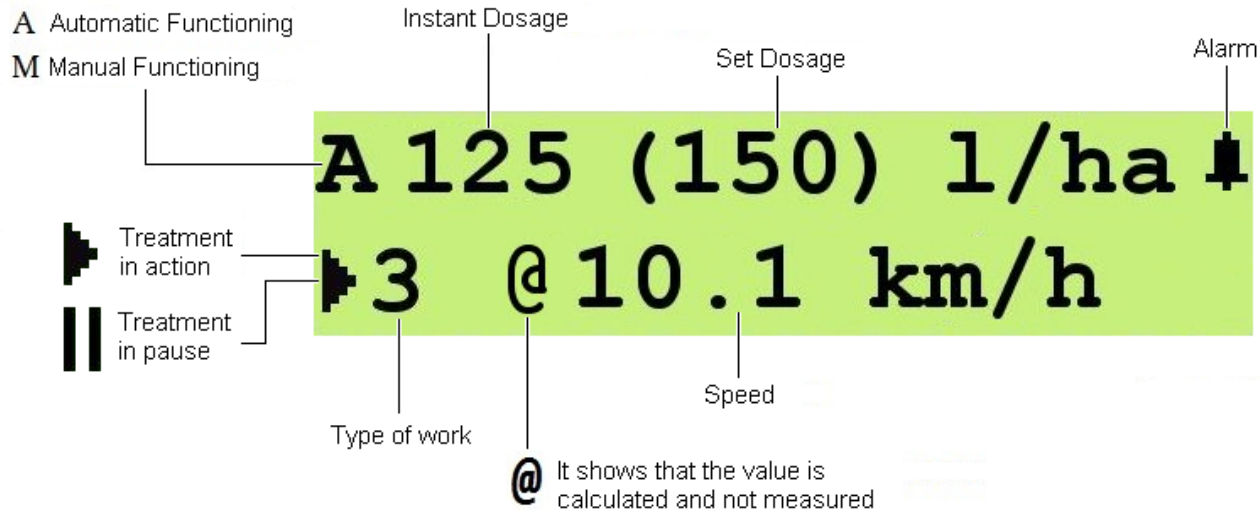
TREATMENT VISUALIZATION

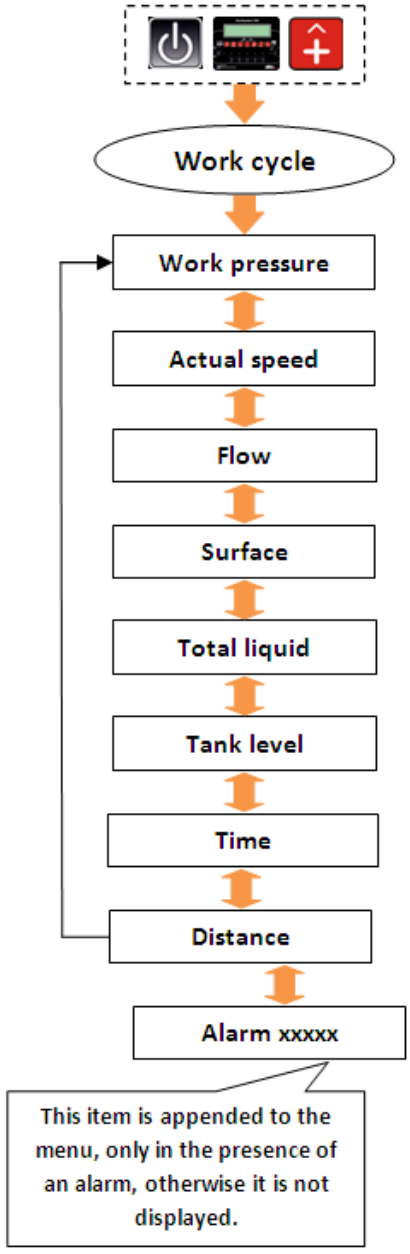
1 Press for 3 seconds the OK key to enter into the menu that allows to visualize the tail of the last 20 treatments.



2 Using the + and − key, it is possible to scroll up and down the treatment list. Press OK to enter into the one of them.

DISPLAY VISUALIZATION





ALARMS

At the activation of one alarm you will hear a sound from the buzzer.

Press Reset Delete to disable it.

The active alarm state is highlighted by the sign on the right of the first line of the display.

1. Valve box alarm	Alarm valve box
2. Flow regulation alarm	Alarm flow regulation
3. Tank empty alarm	Alarm tank empty
4. Minimum flow alarm	Alarm minimum flow
5. Maximum flow alarm	Alarm maximum flow
6. Low battery alarm	Alarm: LOW BATTERY!
7. Low pressure alarm	Alarm: low pressure

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inside[btb]

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